between bevels **20**, for draining off the product aluminium to maintain canals **40'** of aluminium in the V or U-shaped grooves at a constant level. Such cross-channels can be formed in one or both ends of the blocks and, if required, one or more intermediate cross channels can be formed by machining grooves across the blocks **10**, intersecting with the V or U-shaped grooves formed by bevels **20**.

These cross-channels are connected to a reservoir of molten aluminium, possibly with a weir in order to set the level of the aluminium canals **40'**. Operation is possible with a fluctuating level of the aluminium canals **40'** or with a steady level.

The present invention has been described with respect to preferred embodiments. Modifications and alterations will occur to others upon the reading and understanding of the specification. It is intended that all such modifications and alterations be included insofar as they come within the scope of the invention as claimed and equivalents thereof.

What is claimed is:

1. An electrolytic cell for the electrowinning of aluminium from alumina dissolved in a fluoride-based molten electrolyte, having a series of anodes facing a cathode cell bottom, the cathode cell bottom comprising a series of juxtaposed cathode blocks each having a sloped drained top cathode surface down which a layer of produced molten aluminium is continuously drained when the cathode block is in use to electrowin aluminium, the top surfaces of several cathode blocks placed laterally side-by-side forming a series of V-shaped sloped cathode surfaces, each cathode block further comprising a cut-out along the lower edge of its sloped top surface, so that two cathode blocks placed side-by-side and forming a V-shaped cathode surface have a recessed groove formed between them by juxtaposition of their respective cut-outs, said recessed groove being located along and below the bottom of the V-shaped sloped cathode surface, said groove during cell operation collecting and evacuating the molten aluminium drained from the bottom of the sloped V-shaped cathode surfaces.

2. The electrolytic cell of claim **1**, wherein the cell bottom is made of a series of carbon cathode blocks, each having a sloped top surface, a plurality of side surfaces and a bottom surface, the cathode blocks being connected side-by-side, transverse to the cell, said blocks being further provided with conductive bars for the delivery of current, said conductive bars being generally parallel to one another and transverse to the cell.

3. The electrolytic cell of claim **2**, wherein at least some of the recessed grooves are formed by cut-outs along the edges of the cathode blocks.

4. The electrolytic cell of claim **2**, wherein the sloping surfaces of the cathode blocks making up the cell bottom are treated to reduce sodium penetration.

5. The electrolytic cell of claim **4**, wherein the sloping surfaces of the cathode blocks making up the cell bottom are coated with a layer which reduces sodium penetration.

6. The electrolytic cell of claim **2**, wherein the sloping surfaces of the cathode blocks making up the cathode cell bottom are coated with a layer which, prior to or in use, becomes harder than the carbon cathode block.

7. The electrolytic cell of claim **2**, wherein the cathode blocks remain dimensionally stable during electrolysis.

8. The electrolytic cell of claim **2**, wherein the cathode blocks are made resistant to chemical and mechanical attack.

9. The electrolytic cell of claim **1**, wherein the sloped cathode surfaces of the cathode cell bottom are coated with a layer of aluminium-wettable refractory material.

10. The electrolytic cell of claim **1**, wherein the molten aluminium is at a constant level within the recessed grooves.

11. The electrolytic cell of claim 1, wherein the sloped cathode surfaces further comprise at least one cross channel which intersects with the parallel recessed grooves, said cross channel extending in the longitudinal direction of the cell.

12. The electrolytic cell of claim 11, wherein the cell bottom is sloping longitudinally and wherein the cross channels run down the sloping cell bottom.

13. The electrolytic cell of claim 1, wherein the recessed grooves have a U-shaped cross-section.

14. The electrolytic cell of claim 1, wherein the recessed grooves have a rectangular cross-section.

15. The electrolytic cell of claim 1, wherein the recessed grooves have a trapezoidal cross-section.

16. The electrolytic cell of claim 1, wherein the recessed grooves have a V-shaped cross-section.

17. The electrolytic cell of claim 1, wherein the recessed grooves have a curved or rounded cross-section.

18. The electrolytic cell of claim 1, wherein the recessed grooves have an asymmetric cross-section.

19. The electrolytic cell of claim 11, wherein the cell bottom comprises a plurality of pairs of two longitudinally sloping parts and the cross channels run down these sloping parts, there being at the intersection of the two sloping parts a collecting recessed groove, said cross channel leading to an aluminium reservoir.

20. The electrolytic cell of claim 1, wherein the recessed grooves extend transversely with respect to the cell and lead into at least one cross channel arranged longitudinally with respect to the cell for collecting the molten aluminium.

21. A method of manufacturing the cathode bottom of an electrolytic cell for the electrowinning of aluminium from alumina dissolved in a fluoride-based molten electrolyte, said cell having a series of anodes facing a cathode cell bottom, the cathode cell bottom comprising a series of juxtaposed cathode blocks each having a sloped drained top cathode surface down which a layer of produced molten aluminium is continuously drained when the cathode block is in use to electrowin aluminium, the top surfaces of several cathode blocks placed laterally side-by-side forming a series of V-shaped sloped cathode surfaces, the method comprising:

a) before or after assembling the cathode blocks in a cell providing a sloping cathode top surface on each cathode block; and

b) further providing a cut-out along the bottom of each sloping cathode top surface so that two cathode blocks placed side by side in the cell form a V-shaped top surface with a recessed groove formed between them,

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said recessed groove formed by the juxtaposition of the respective cut-outs of the cathode blocks, said recessed groove being located along and below the bottom of the V-shaped sloped cathode surface, and said groove during cell operation collecting and evacuating the molten aluminium drained from the bottom of the sloped V-shaped cathode surfaces.

22. The method of claim 21, wherein the recessed grooves and/or sloping sections are machined in the top of the cathode blocks.

23. The method of claim 21, comprising the further step of treating the cathode blocks to make them resistant to chemical and mechanical attack.

24. The method of claim 21, wherein before start up of the cell for producing aluminium, the cell bottom is treated to harden the top surfaces of the cathode blocks and to render the top surfaces wettable by molten aluminium, thereby rendering the cathode blocks dimensionally stable during electrolysis.

25. A method of producing aluminium in a cell for the electrowinning of aluminium from alumina dissolved in a fluoride-based molten electrolyte, said cell having a series of anodes facing a cathode cell bottom, the cathode cell bottom comprising a series of juxtaposed cathode blocks each having a sloped drained top cathode surface down which a layer of produced molten aluminium is continuously drained when the cathode block is in use to electrowin aluminium, the top surfaces of several cathode blocks placed laterally side-by-side forming a series of V-shaped sloped cathode surfaces, each cathode block further comprising a cut-out along the lower edge of its sloped top surface, so that two cathode blocks placed side-by-side and forming a V-shaped cathode surface have a recessed groove formed between them by juxtaposition of their respective cut-outs, said recessed groove being located along and below the bottom of the V-shaped sloped cathode surface, the method comprising:

a) passing an ionic current between the cathode bottom and facing anodes to electrolyze dissolved alumina;

b) thereby producing gas on the anodes and aluminium on the drained cathode surfaces; and

c) allowing the produced molten aluminium to drain down the cathode surfaces into the collection and evacuation grooves located along the bottom of the V-shaped sloped cathode surfaces and extending below the sloped cathode surfaces.

26. A cathode bottom of a cell for the electrowinning of aluminium from alumina comprising a horizontal aluminium-wettable drained cathode surface having a series of parallel spaced apart recessed grooves extending across the cathode bottom for facilitating collection of product aluminium draining from the horizontal cathode surface, wherein the cathode bottom comprises a series of cathode blocks placed side-by-side along the cathode bottom, each block extending lengthwise across the cathode bottom, the cathode blocks having flat top surfaces that form said horizontal aluminium-wettable drained cathode surface and having cut-outs or bevels along opposite upper side edges that extend across the cathode bottom so that two cathode blocks placed side-by-side along their cut-outs or bevels form between them one of said recessed grooves across the cathode bottom.

27. The cathode bottom of claim 26, wherein said recessed grooves have a generally U-shaped or V-shaped cross-section.

28. The cathode bottom of claim 27, wherein the cathode blocks comprise at least one further recessed groove between and parallel to said recessed grooves across the cathode bottom.

29. The cathode bottom of claim 28, wherein said recessed grooves lead into at least one aluminium collection channel arranged longitudinally along the cathode bottom for draining off the molten aluminium.

30. The cathode bottom of claim 29, wherein the or at least one longitudinal aluminium collection channel is a deep central channel.

31. The cathode bottom of claim 30, wherein the or at least one longitudinal aluminium collection channel extends along a side of the cathode bottom.

32. The cathode bottom of claim 31, wherein the cathode blocks have further cut-outs or bevels along top end edges to form the or at least one longitudinal aluminium collection channel.

33. The cathode bottom of claim 32, wherein a plurality of said longitudinal aluminium collection channels run across the horizontal top surface of at least one of the cathode blocks.

34. The cathode bottom of claim 33, wherein each cathode block extends across substantially the entire cathode bottom.

35. The cathode bottom of claim 34, wherein several cathode blocks arranged end-to-end extend across substantially the entire cathode bottom.

36. The cathode bottom claim 35, wherein the cathode blocks are made of carbon.

37. The cathode bottom of claim 36, wherein the cathode blocks comprise an aluminium-wettable coating which forms the horizontal aluminium-wettable drained cathode surface.

38. The cathode bottom of claim 37, wherein the cathode blocks are further provided with steel or other conductive bars for the delivery of current which extend generally parallel to one another across the cathode bottom.

39. A cathode block for the electrowinning of aluminium from alumina, comprising a flat aluminium-wettable top cathode surface for forming a horizontal

aluminium-wettable drained cathode surface of a cathode bottom and cut-outs or bevels along opposite upper side edges so that two cathode blocks placed side-by-side in a cathode bottom along their cut-outs or bevels form between them a recessed groove for facilitating collection of product aluminium draining from the horizontal cathode surface.

40. A cathode bottom for the electrowinning of aluminium from alumina, comprising a plurality of cathode blocks as defined in claim 39 placed side-by-side along their cut-outs or bevels so that the top cathode surfaces of the side-by-side blocks form a horizontal aluminium-wettable drained cathode surface and the cut-outs or bevels of the cathode blocks form recessed groove(s) between the cathode blocks.

41. A cell for the electrowinning of aluminium from alumina, comprising a cathode bottom as defined in claim 40.

42. The cell of claim 41, which comprises dimensionally stable anodes.

43. The cell of claim 41, which comprises carbon anodes.

44. A method of producing aluminium comprising passing an electrolysis current in a molten electrolyte containing dissolved alumina between an anode and a horizontal aluminium-wettable drained cathode surface of a cathode bottom as defined claim 40, to evolve gas on the anode and produce on the drained cathode surface molten aluminium which drains into the recessed grooves of the drained cathode surface.